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EFFECTS OF YOUTUBE INSTRUCTIONAL VIDEO ON SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN AGRICULTURAL SCIENCE IN NIGER STATE

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Abstract
The study determined the effects of YouTube instructional video on secondary school students' achievement in Agricultural Science in Niger State. The study adopted a pretest, posttest research design .The sample size consisted of 120 students selected from 4 secondary schools in Niger State. Two schools were assigned to experimental group and two for control group. Agricultural Science Achievement Test (AAT) was used for the collection of data. The research instrument was validated by three experts in the field of science education. The reliability of the instrument was carried out using Cronbach Alpha formula and the reliability co-efficient was found to be 0.87. The data were analysed using mean and standard deviation to answer the research questions while ANCOVA statistic was used to test the hypotheses at 0.05 level of significance. The findings of the study revealed that the experimental group had a mean of 27.73 and performed significantly better than the control group with a mean of 15.98.The study further revealed that there was no significant difference in the mean performance of male and female students who were taught by means of YouTube video instruction , the study recommended the use of YouTube video instruction by teachers as a way of improving students' performance. Also, provision of computer laboratory/equipment and internet facilities, educational software, e-library and e-resource would help to reduce the abstractness of some concepts in Agricultural Science.

Introduction

There is a great demand for instructional materials in all disciplines in an effort to make teaching and learning more beneficial to learners. This demand is higher in the area of science education than in other areas (Alexander, 2006). Science education emphasis is on skill acquisition. The use of instructional materials is very essential if students are to learn positively in a productive manner. (Cayeri, 2009), where emphasis is on stimulus-organism-response (S-O-R).

Learning enhanced by information technologies is gaining momentum and this is partially in response to the demand for reduction in time to competency in the knowledge based economy, spurred by intensive competition and globalization. E-learning has therefore become a promising alternative to the traditional classroom learning, thereby helping society to move toward a vision of lifelong education and on demand learning (Hartley, 2009). It has become one of the fastest moving trends and aims to provide a configurable infrastructure that integrates learning materials, tools, and services into a single solution to create and deliver training or educational content quickly, effectively, and economically. Thousands of online courses are now being offered with different video of the concept taught*in different institutions (Nwachukwu, 2008).*

YouTube videos that can provide supplementary information for the class in teaching and learning, give inspiration and help to keep control of the class. YouTube usually aids teachers and students to provide video services that can help in the classroom situations (Zhang,2004)). YouTube is more than just a cute cat video site. It is matured into one of the biggest resources for educational content ever. Videos can make the subject or lesson more applicable to students' everyday lives by uploading the videos to classes on YouTube channel.

Hartley (2009) pointed out the importance of YouTube Video through video utilization in e-learning, the teacher can keep class exciting and new. The findings have shown that students benefit from e-learning and some of the benefits are that it:

i. Provides time and location flexibility.
ii. Results in cost and time savings for educational Institutions.
iii. Fosters self-directed and self-paced learning by enabling learner-centered activities.
iv. Creates a collaborative learning environment by linking each learner with physically dispersed experts and peers.
v. Allows unlimited access to electronic learning material.
vi. Allows knowledge to be updated and maintained in a more timely and efficient manner.

A new initiative, 'YouTube for Schools' is a digital learning portal that gives teachers and students the ability to share and view videos specifically for use in the classroom. YouTube teamed up with teachers and educational organizations to help a digital video-sharing community dedicated to learning. The followings are ways teachers and students' benefit from YouTube's newest platform and how they can maximize the site for educational purposes;

1. Distracting content and comments: YouTube for schools filters out the inappropriate videos that have forced schools to restrict student access to the video-sharing site in the past. Now teachers have confidence that students watching YouTube videos are on task.

2. Assign videos for home and extra credit: Watching videos in class is a cause for celebration in many classrooms, so why not take advantage of the sentiment? YouTube for Schools allows students to finish videos started in class, watch additional videos on subjects of interest, and serve as excellent homework fodder, while being craftily disguised as entertainment. It might be just what students need to embrace dense topics and difficult subjects with enthusiasm.

3. Use pre-made playlist: YouTube

educational organizations to create stock playlists for teachers to use when their classroom curriculumneeds refreshing. Teachers can browse and choose from subjects like agriculture, Mathematics, Science and such others.

4. Personalize your playlists: YouTube for Schools is intended for teachers to foster a deeper understanding of classroom material. That's why it makes sense for instructors to take full advantage of the far-reaching corners of YouTube's international community. While students can't peruse beyond those approved by the YouTube Education division, teachers can put any relevant video into their playlists that they wish. The ability to personalize video playlists might make the difference between a student who is eager to learn and one who is eager for the bell.

5. Be part of the village: Teachers can create a far-reaching community of instructors thanks to YouTube for Schools' playlist sharing feature. It allows instructors to 'follow' and swap playlists with other instructors to make for a more dynamic learning experience. Video allows students to view actual objects and realistic scenes, to see sequences in motion and to listen to narration.

The Learning By Asking (LBA) system used in this experiment used video that was logically segmented into small clips based on content. In comparison to traditional classroom learning, e-learning with interactive video gives several distinct advantages such as:

i. Allowing online learners to watch in-class activities and listen to instructors repeatedly as needed, while, in a traditional classroom, students may not be able to ask instructors to repeat what they do not understand. Therefore, interactive video may provide better support to learners for understanding the learning material and enhances self-paced learning.

ii. Enables random content access, which is expected to increase learner engagement thereby improving learning outcome and satisfaction.

iii. Increasing the attention, involvement, and subsequent learning through individualized learning. Traditional classroom learning is more instructor-centered, with controlled teaching space and content. Students may easily lose attention when they do not follow the instructor. Therefore, students in e-learning environments with interactive video may be better than students in traditional classrooms.

In agriculture, harrow is an implement for breaking up and smoothing out the surface of the soil. In this way it is distinct in its effect from the plough, which is used for deeper tillage. Harrowing is often carried out on fields to follow the rough finish left before ploughing operations. The purpose of this harrowing is generally to break up clods (lumps of soil) and to provide a finer finish, soil structure that is suitable for seedbed use. Such coarser harrowing may also be used to remove weeds and to cover seed after sowing. Harrows differ from cultivators in that they disturb the whole surface of the soil, such as to prepare a seedbed, instead of disturbing only narrow trails that skirt crop rows (to kill weeds). There are four general types of harrows: disc harrow, tine harrow, chain harrow and chain disk harrows. However, Harrows were originally drawn by draft animals, such as horses, mules, or oxen, or in some times and places by manual laborers'. In modern practice they are almost always tractor-mounted implements, either trailed after the tractor by a drawbar or mounted on the three-point hitch.

Statement of the Problem

Despite the importance of agriculture to man and the society at large, many factors have been identified as responsible for the poor achievement of students in Agricultural Science. Such factors include poor method of teaching and lack of equipment. Most of the methods adopted by many teachers in post primary schools are contributing factor to students' poor achievement. Another disturbing factor is the fact that most

Agricultural Science teachers seem not to utilize available materials found in the students' environment to teach the subject. This invariably affects students' understanding of the skill of mechanized farming. The difficulties they may encounter due to poor background of the subject, lack of broad knowledge of the subject, with other relevant factors accounts for the failure of students in agriculture. The research carried out on students' achievement using YouTube Video and compares its effectiveness with students who do not have means of revising what was taught in classroom with reference to YouTube video. Therefore, this study determined the effects of YouTube instructional video on secondary school students' academic performance in Agricultural Science in Niger State.

Research Questions

The following research questions were raised and answered:

1. What is the mean achievement scores of students taught using YouTube Videos and those taught using lecture method in agricultural science?
2. What is the mean achievement scores of male and female students taught Agricultural Science using YouTube video?

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance:

HO_1: There is no significant difference in the mean achievement scores of students taught agricultural science using YouTube video instruction and those taught using lecture method.

HO_2: There is no significant difference in the mean achievement scores of male and female students taught agricultural science using YouTube Video instruction.

Methodology

This study adopted a quasi-experimental design specifically a pretest, posttest, non-randomized, non-equivalent control group design. This design is chosen because intact class was used for the study where the subjects were not randomly selected. The design controls almost all the threats to internal validity of an experiment and also gives data which is easily interpretable and can be analyzed to answer research hypotheses and research questions. The independent variable was the use of YouTube instruction and the dependent variable was the academic performance of the SSII students and gender was the moderating variable

The population for the study was made up of 42,347 senior secondary school agricultural science students in Niger state (Niger State Ministry of Education, 2016). The target population was senior secondary school students in SS II. Purposive sampling technique was used because of internet and computer facilities in the sampled schools. Intact classes ware used in the four secondary schools selected in zone A of Niger state. Two schools were assigned to the experimental group and two schools assigned to control group using simple random sampling technique. The sample for research study was made up 120 Students. The instrument used for the study were 30 multiple choice items on Agricultural Science Achievement Test (AAT), selected from WAEC past questions from senior secondary schools syllabus in the year 2009/2012. Each test item had possible answers or options (A-E). Only one of the five options is correct answer. The items covered all aspects of preparation of farmland and students were required to answer all the 30 questions, ticking (√) the correct option out of the five options provided. The reliability coefficient of the Agricultural Science Achievement Test (AAT), were determined using Cronbach Alfa, with a Reliability Coefficient of 0.87. The cooperation of the staff in all selected schools, was sought, for the real experiment. The agricultural science teachers' were trained as research assistants in the use of YouTube videos to teach harrowing a farm land to the secondary SS II students in

agricultural science in Zone "A". The test administered was supervised by the researchers and research assistants and the study lasted for four weeks. In the first visit to the selected schools, the researchers administered pre-test to the students and the result analyzed. Three weeks was used to teach the students on how to prepare farming through the use of YouTube Videos for experimental group while control groups the students were taught using lecture method. At the end of the last week of teaching, posttest was administered to both groups. The data obtained was analyzed statistically using means, standard deviation for the research questions and analysis of covariance (ANCOVA) for the hypotheses.

Results and Discussion

Research Question 1: What is the mean achievement scores of students taught using YouTube Videos and those taught using lecture method in agricultural science?

Table 1: Mean and Standard Deviation of the Mean Achievement Score of the Pretest and Posttest Scores of the Experimental and Control Group

Group	N	Pretest Mean	SD	Posttest Mean	SD	Mean Gain
Experimental Group	58	7.58	2.988	27.73	1.912	11.75
Control Group	62	7.33	3.144	15.98	3.255	

Table 1 shows the mean achievement scores of students taught harrowing using YouTube Video instruction and those taught using lecture method in agricultural science. The pretest mean achievement scores as shown in the table is 7.58 and 7.33 for the experimental and control group respectively. The mean achievement score in the posttest is 27.73 for the experimental group and 15.98 for the control group .The mean gain is11.75 in favor of experimental group. This result indicated that the experimental group achievement better than the control group.

Research Question 2: What is the mean achievement scores of male and female students taught agricultural science using YouTube video instructional package?

Table 2: Post-test Mean Achievement Score of Male and Female Students Experimental Group

Group	Gender	N	Pretest Mean	SD	Posttest mean	SD	Mean Gain
Experimental	Female	20	7.72	2.937	22.69	1.921	2.29
	Male	38	7.21	3.957	20.40	3.957	

Table 2 show the mean achievement score of male and female students taught harrowing using YouTube video instructional package in agricultural science. For the female students, the mean achievement score is 22.69 in the posttest while the male had the mean of 20.40 therefore having a mean gain of 2.29 in favor of the female students.

$H0_1$: There is no Significant Difference in the Mean achievement Scores of Students TaughtAgricultural Science using YouTube Video Instruction and those Students taught Agricultural Science using Lecture Method.

Table 3: Summary of ANCOVA Table of Students Achievement Scores in Agricultural Science.

Source variation	Sum of Squares	Df	Mean Square	F	Sig
Corrected model	25203.880[a]	4	6300.970	111.660	,000
Intercept	36182.534	1	641.192	641. 192	.001
Treatment	24778.719.	1	24778.719	439.105	.000
Gender	264. 878	1	264.878	4.694	.083
Treatment * Gender	5.227	1	5.227	.093	.0762
Error	3103.656	55	56.430		
Total	349933.710	59			
Corrected Total	28686.187	58			

Table 3 shows the ANCOVA comparison of Posttest Scores of students who were taught using YouTube and Lecture method. An examination of Table 1 with F (1, 59) = 439.105, p = 0.000, the results of the analysis indicates that this hypothesis is rejected on the basis that the main effect (treatment) was significant. The results revealed that the YouTube instructional video produced significant effect on the posttest achievement scores of students.

HO_2: There is no significant difference in the mean achievement scores of male and female students taught agricultural science using YouTube Video instruction.

Table 3 shows that the F value of 4.694 was not significant at 0.05 alpha level i.e. F (1, 59) = 4.694, p0.083. The result shows that there was no significant difference in the performance of male and female students taught using YouTube instructional video. On this basis, hypothesis two is therefore retained. This shows that male students' achievement did not differ significantly from that of female students when both were taught with YouTube instruction.

The major findings of the research include the following:

1. The result of research question one indicated that the experimental group performance better than the control group.The results of hypothesis one further revealed that the YouTube instructional video produced significant effect on the posttest achievement scores of students which simply mean that exposure of the YouTube videos instructional package in the experimental group significantly improved the students' achievement in agriculture.

2.The result of research question two indicated the mean gain of 2.29 in favor of the female students. But theresultof hypothesis two shows that male students' achievement did not differ significantly from that of female students when both were taught with YouTube instruction.

YouTube Video instructional package as a teaching strategy significantly improved the performance of the students in learning the concept of land clearance (harrowing) more than the traditional lecture method.

Discussion of Results

The pretest mean performance scores in table1 revealed that the subjects before the experiment have the same entry qualification as shown by the mean of 7.58 and 7.33 for the experimental and control group respectively. The mean academic performance score in the posttest is 27.73 for the experimental group and 15.98 for the control group .The mean gain is 11.75 in favor of experimental group. This result indicated that the experimental group performance better than the control group. Also Table 2 show the mean performance score of male and female students taught harrowing using YouTube video instructional package in agricultural science. For the female students, the mean

performance score is 22.69 in the posttest while the male had the mean of 20.40 therefore having a mean gain of 2.29 in favor of the female students.

The findings revealed that there was significant differences in the mean achievement scores of student taught using YouTube instructional video and those students taught agricultural science using lecture method. The outcome of testing hypotheses of the study showed that the use of YouTube videos instruction and internet facilities could bring about significant improvement in teaching and learning of Agricultural Science. The students that are exposed to YouTube instructional video performed significantly better in experimental group, while the students in control group that were not exposed to YouTube instructional video performed lower than their counter parts. This implies that students in experimental group taught with assisted instructional package achieved significantly better than students in control group, who were taught with traditional lecture method alone.

The results further revealed that there is no significant difference in the mean achievement score of male and female students taught agricultural science using YouTube Video instructional package. This finding agree with Krendl and Broihier (1992) and Osokoya (2007) who revealed no significant differences in the achievement of male and female students exposed to video instructional package in History and Integrated Science.

Conclusion

The study showed that the use of YouTube Video instructional packages have the capability of improving the achievement of students in agricultural science.

The following conclusions were drawn from the findings of the study:

i. The experimental group who were exposed to YouTube Video instruction package performed better than the control group who were not exposed to any research treatment.

ii. The experimental group who were taught with YouTube Video instruction package achieved better because they saw, heard and interact with lesson and classmates.

Recommendations

From the findings of the research, the following recommendations were made for the improvement of learning harrowing in secondary schools:

I. ICT equipment for teaching and learning in the schools should be encouraged. In order to achieve this, curriculum designers should infuse the use of computer into school curricula.

ii. Educators should continue to lay more demand on the concepts of educational technology as a means of enhancing the quality of education.

iii. Computer and internet facilities, assisted instructional packages, educational software; power point presentation with projectors should be encouraged to improve teaching and learning process.

iv. In-service training should be given to teacher on the applications of educational technology particularly on the use of YouTube in classroom instructions by the proprietors.

v. Educational authorities should provide necessary enabling environment as well as materials and manpower required for the teaching and learning of all subjects using technology. To achieve this, government should provide adequate funds and seek for financial aids from bodies like United Nations Educational Scientific and Cultural Organization (UNESCO), United Nations International Children Education Fund (UNICEF), United State Agency for International Development (USAID), as well as Non-Governmental Agencies (NGO's) in Nigeria to assist in promoting and funding computer

technology and internet facility in our schools.

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